NISTTech

Parallel X-Ray Nanotomography

Create 3-D models with pixels in the nanometer range

Description

Generate nanometer scale three dimensional tomographic images using this compact, inexpensive x-ray nanotomography process. It produces images with nanometer range cross-sectional pixel sizes. The technology is a composite objective lens comprising an array of micro-objectives, such as an array of Fresnel zone plates, and a point-like x-ray source such as a laser plasma x-ray source. Other x-ray generating sources may be used as well, such as an electron beam microfocus x-ray source.

Applications

- **Medical diagnosis**
  More images at a fraction of the cost.
- **Manufacturing**
  Use for industrial sample acceptance, industrial process analysis, industrial research, analyses of integrated circuit interconnects.

Advantages

- **Compact and economical**
  Less expensive and more compact that processes involving synchrotrons.
- **High resolution at lower costs**
  Creates accurate reconstructions (3-D models) by detecting a larger fraction of the x-rays.
- **Capable of collecting plural images**
  Forms simultaneous plural images while avoiding interference between the images.

Abstract

A parallel nanotomography imaging system is provided having an x-ray source, which is preferably a laser-based x-ray source that generates x-rays that are collected using a collector optic and are received in a composite objective assembly. The composite objective assembly includes plural micro-objectives, each imaging the target. The x-ray image is received by an x-ray image formation and acquisition apparatus, and processed and/or displayed.

Inventors

- Levine, Zachary H.
- Turcu, I. C. Edmond

References

- U.S. Patent #6,389,101 issued 05-14-2002 , expires 05/24/2020
- Docket: 99-027

Status of Availability

active patent and available for licensing

Last Modified: 12/30/2009